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Dust structurization observed in a dc glow discharge dusty plasma[1] JONATHON R. HEINRICH, SU-HYUN KIM, ROBERT L. MERLINO, University of Iowa — Dusty plasmas, which are inherently open systems which require an ionization source to replenish the plasma absorbed on the grains, tend to exhibit self-organization. Various structures have been observed in dusty plasmas such as dust crystals, voids, and vortices. Due to the presence of drifting ions in dc discharge plasmas, spontaneously excited dust acoustic waves are also a common occurrence. By adjusting the discharge parameters we have observed a new phenomenon in dusty plasmas – the spontaneous formation of three-dimensional stationary dust density structures. These structures appear as an ordered pattern consisting of alternating regions of high and low dust density arranged in a nested bowl-type configuration The stationary structure evolves from dust density waves that slow down as their wavelength decreases and eventually stop moving when the wavelength reaches some minimum size.

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